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ABSTRACT

This report presents initial findings of a field study which focused on the academic achievement and behavioral and social adjustment of 148 kindergarten children who entered first grade early. The study took place in Broward County, Florida, following implementation of the 1973 state legislation permitting early entrance into first grade for children who attained the age of 6 during the school year, attended kindergarten, and successfully passed a readiness test approved by the Florida State Board of Education. A first grade prereading test was used to screen early entry applicants in Broward County schools. In this study, early entrants were compared with (1) kindergarteners who qualified for early entry but whose parents elected to keep them in kindergarten, and (2) first graders who scored among the upper 20% in the county-wide distribution of prereading test scores. Groups were compared on achievement test scores, teacher ratings of behavior, and peer acceptance. Results indicate that early entrants into first grade will do well academically, but will be less self-reliant and less socially accepted by their peers than either their bright kindergarten counterparts or their bright first grade classmates. (ED)

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A STUDY OF EARLY ENTRY INTO FIRST GRADE

1973-74

PS 008514

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PREFACE

This report presents the initial findings of a study undertaken in the Broward County public schools, Fort Lauderdale, Florida, following its implementation of the 1973 State Legislation on early entrance into the first grade. The research has focused upon an investigation of academic achievement, as well as behavioral and social adjustment.

One would predict that from the findings of this initial investigation that early entrants into first grade will do well academically, will be less self-reliant and less socially accepted by their peers than either their bright kindergarten counterparts or their bright first grade classmates. Whether this prediction remain sound as the children progress through school is a question of tremendous importance to future legislative deliberations and curriculum planning in the schools.

INTRODUCTION

LEGISLATION

The 1973 session of the Florida Legislature enacted into law House Bill 513[1], effective July 1, 1973, permitting the early entrance of kindergarten children into first grade providing that the child attained the age of six during the school year, attended kindergarten, and successfully passed a readiness test approved by the State Board of Education.

State Board of Education regulations developed to implement the legislation required each district to submit to them a copy of the readiness test as well as the criteria for successful completion of the test. Upon approval school district personnel were to administer and score the test. In addition they were to certify attendance in kindergarten, communicate test results to parents, and place or not place the applicant into first grade. All testing and placement was to be completed by the end of the first month of school.

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[1] Florida School Laws, 1973 Edition, Florida Statues, Section 232.01, Department of Education, Tallahassee, Florida, 1973.

IMPLEMENTATION OF THE LEGISLATION IN BROWARD COUNTY, FLORIDA

The Prereading Test, Look, Listen and Learn, The Bookmark Reading Program,[2] was administered to all first grade students as an initial screening measure so that students could be appropriately placed within the reading program. The decision was made to use the same test for early entry applicants with the following criteria established as successful scores for placement into first grade:

Total battery score of 156 and not less than the following scores in each subtest:

Visual Discrimination	31
Visual Memory	8
Auditory Discrimination	28
Letter-Name Knowledge	18
Critical Thinking	18
Sound Letter Relationship	8

It was approximated that students meeting the above criteria would place in about the 80th percentile of the population. An analysis of the test criteria reveals that the area of critical thinking gave applicants the most difficulty. Further study of this data might indicate a strong relationship between this subtest and pupils' scores on IQ tests.

---

[2]Rita Sawyer, Lucille B. Taylor, Prereading Test, Look, Listen, and Learn, The Bookmark Reading Program, Harcourt Brace, Jovanovitch, Inc., 1971.

INITIAL EARLY ENTRY DATA

A statewide survey indicates that 5,047 students were tested for early entry. Of these, 1,099 passed their respective test criteria and were placed in first grade while 353 elected to remain in kindergarten.

By comparison the district reporting tested 934. Of these 148 were placed in first grade while 75 passed but elected to remain in kindergarten. Parents gave the following reasons for wanting their children admitted early:

> They felt they had an extremely bright child who could go ahead.
>
> They felt their child already had enough preschool experience and did not want him to have to repeat the same experiences.
>
> Because both parents work they needed a full day program and kindergarten offered only a half day program.

It is interesting to look at some of the characteristics of the applicant group. Of the 934 applicants, 60 were black while 874 were white. Of the 60 black applicants, five met the criteria and were admitted to first grade. All early entrants were from middle to high socioeconomic backgrounds as indicated by parents' occupations and pupils' addresses. Addresses of each child were

INITIAL EARLY ENTRY DATA (continued)

pinpointed on a county map. None of the children lived, for example, in high crime areas. All lived in upper and middle income residential areas.

A STUDY OF EARLY ENTRY INTO FIRST GRADE
1973/74

GENERAL PROCEDURES AND LIMITATIONS

Does early entrance to first grade tend to benefit or harm early entrants? This was the basic issue which motivated the present study.

To answer this question adequately would require comparing pupils who were early entrants into first grade with similar pupils who remained in kindergarten. A research design which permitted isolating the effects of early entrance in the above way is easily conceptualized. A list of all pupils who qualified for early entrance could have been compiled. A control group could have been randomly selected from this list. Members of the control group would have been denied entrance to first grade.

One important obstacle to such a research design would have been the objections of the parents of pupils in the control group. Yet in the absence of sound research, some of the consequences of denying or permitting kindergarten age pupils to enter first grade remain unknown. Practical necessities such as the above often prevent the implementation of strictly experimental studies in on-going educational settings. The urgent informational needs motivating

the compilation of defensible research evidence, however, cannot be ignored. In this particular instance it was highly important to begin to investigate any significant social or academic benefits or liabilities which may have been associated with early entrance.

In such situations educational researchers must resort to non-experimental studies. Such studies are often referred to as "field" studies in contrast to "experimental" studies. While the results of field studies cannot be regarded with the same degree of confidence as is the case with experimental studies, they do provide valuable information which can give direction to future planning and evaluation.

In the present study two comparison groups were selected. One group was composed of kindergarten pupils who met the testing criteria but whose parents decided not to enter them in first grade. In the case of comparisons involving this group and early entrants, it is clear that parental choice was a confounding factor. If the parents of the two groups opted differently in regard to entering their children into kindergarten or first grade, other parental differences may also have influenced the results of any comparisons between the groups.

A second comparison group was selected among first grade students. This group was comprised of a random sample of students who scored among the upper twenty percent in the county-wide distribution of first grade Bookmark scores. It was felt that using the same test criteria for selection in this group as was used in screening early entrants would have been inappropriate. Because of the relative age differential, more first year pupils than kindergarten pupils could be expected to surpass the screening criteria. The procedures followed provided better assurance that the first grade comparison group was composed of pupils who were as academically advanced relative to their age as was the case with the early entrants.

It can be clearly be seen that age as well as the parental option factor were confounding factors in comparisons between early entrants and first grade pupils. Given approximately the same relative abilities and exposure to similar instructional programs, older pupils could be expected to progress somewhat more rapidly than younger ones. The same child can achieve more by the age of six than he can at the age of five simply because of normal growth and maturation.

In comparing early entrants and the first grade group, it appears reasonable to think that the early entrants would have ultimately resembled the first grade group had they not entered first grade early. In other words, the first grade group gave a picture of how the early

entrants probably would have scored on the criterion measures at the end of the first grade, had they waited another year to enter first grade.

Similarly one can say of comparisons involving early entrants and the kindergarten group that it is reasonable to think that the early entrants would probably have resembled the kindergarten group had they, too, opted to remain in kindergarten. The validity of the assumptions involving both comparison groups, however, depends among other things, upon the unknown concomitants of the fact that the parents of the early entrants were the kind of persons who wanted their children to enter first grade early. This factor could not be controlled in the absence of a strictly experimental design.

FINDINGS

A technical presentation of the findings is presented in the appendices. In this section the major highlights of the study are briefly presented. The criterion measures used in the study were achievement test results, teacher ratings of behavior and sociometric data. Results in each of these areas are summarized below.

ACHIEVEMENT

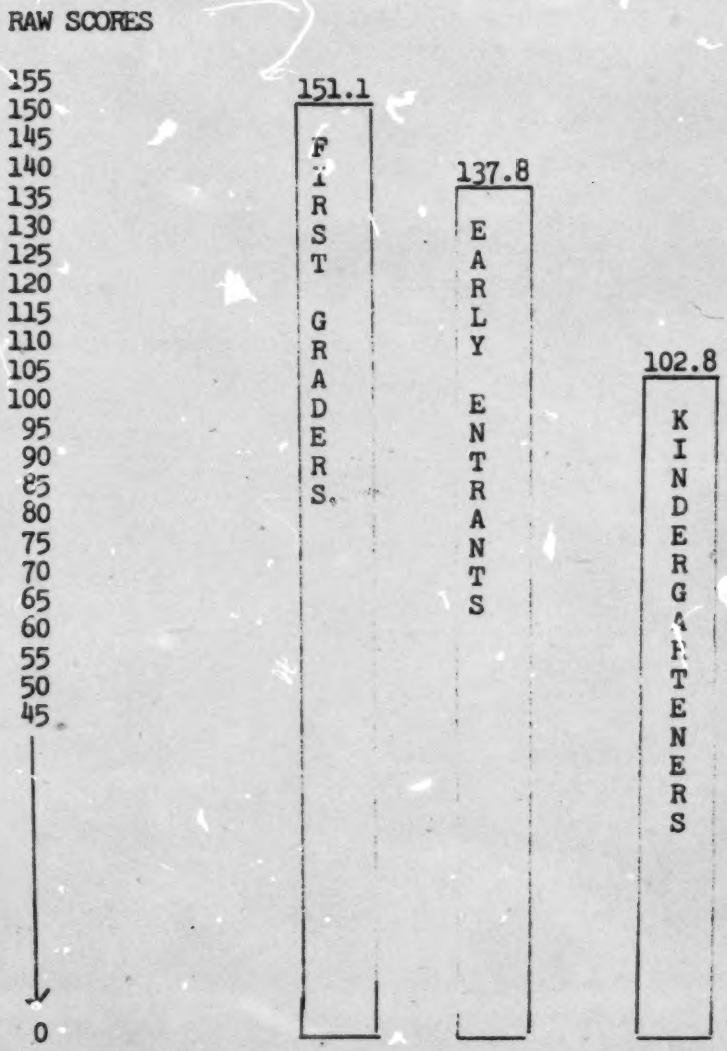
Graph I summarizes the comparisons of the three groups on total battery scores. It can be seen that early entrants scored higher

on this test than they would have had they remained in kindergarten. The early entrants answered about 35 more items correctly than did the kindergarten group.

GRAPH I

ACHIEVEMENT TEST COMPARISONS

(CTBS TOTAL BATTERY)



The gap between the early entrants and first graders was not nearly so pronounced. The early entrants approximated where they probably would have been the next year, had they remained in kindergarten.

These results show that the age factor did not seem to matter as much as the program factor in terms of achievement test results. The difference between kindergarten and first grade programs seemed to count for more than the difference in chronological age.

It may also be noted that school officals felt early entrance may have had a different effect upon boys than girls. In the area of achievement this was not found to be so. Early entrance did not appear to be associated with lower test scores among boys.

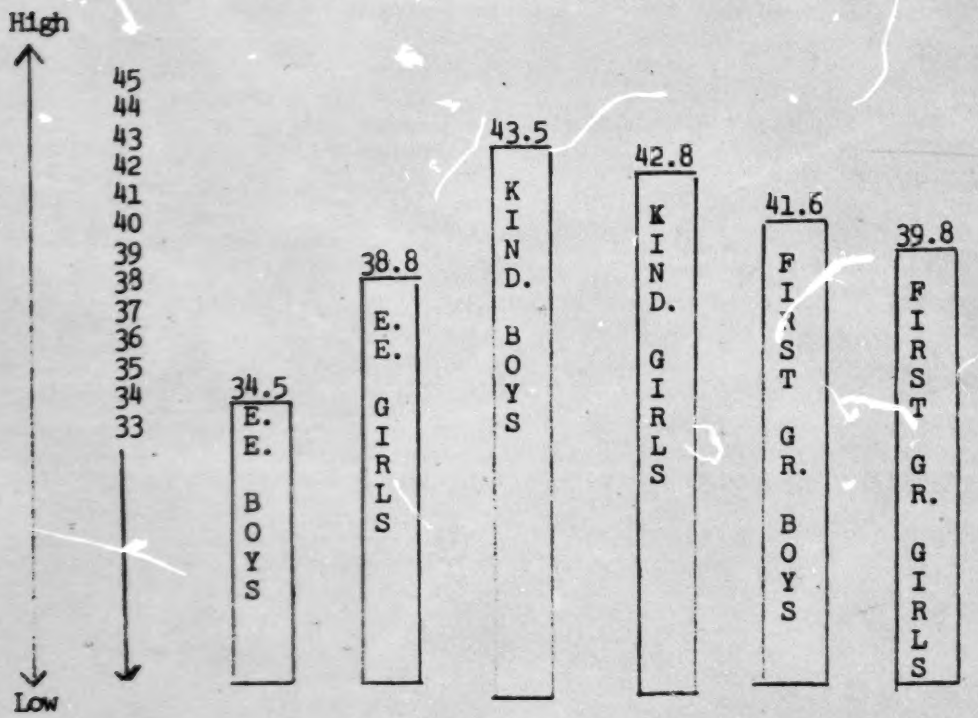
BEHAVIOR RATING RESULTS

The statistical results in this area left the reader with a choice of two possible interpretations. Ratings on one of the scales which was felt to measure self-reliance produced the most notable differences between the groups.

GRAPH II

Behavior Rating Comparisons (Sex Interaction)

Self Reliance

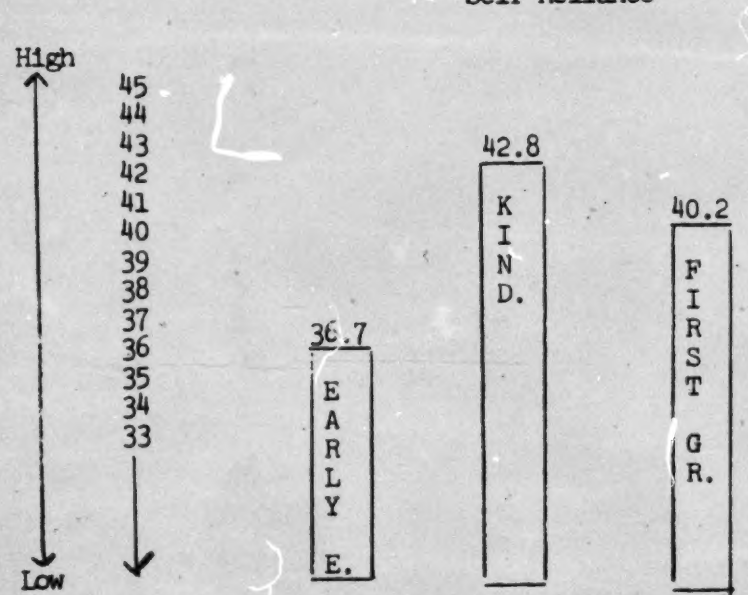


It was on this scale that sex appeared to interact with the early entrance factor in congruence with a hypothesis posited by school personnel. Graph II portrays this hypothesized interaction. It can be seen from the graph that early entrant boys were rated lower on self-reliance than other groups. The sex differences between kindergarteners and first graders were not nearly as large.

Acceptance of the situation depicted in Graph II was not quite warranted in terms of a very strict adherence to conventional statistical practice. The hypothesis was so close to the level of confidence conventionally required for acceptance, however, that its acceptance or rejection really was not a statistical matter. Until further evidence is accumulated the practitioner can choose between the situation depicted in Graph II or that depicted in Graph III.

GRAPH III

Behavior Rating Comparisons (Ignoring Sex Interaction)



In Graph III sex differences were ignored. It can be seen that early entrants on the whole received lower ratings on the self-reliance scale than did pupils in the other two groups.

It must be noted that teacher ratings of early entrants were more variable than among the other groups. This means that more early entrants received high or low ratings than was typical within the other groups. If substantiated by further studies this tendency toward extremes may be found to be of importance. At the present it would appear that early entrants are more prone to either be seen as very self-reliant or the reverse than was true of the other pupils.

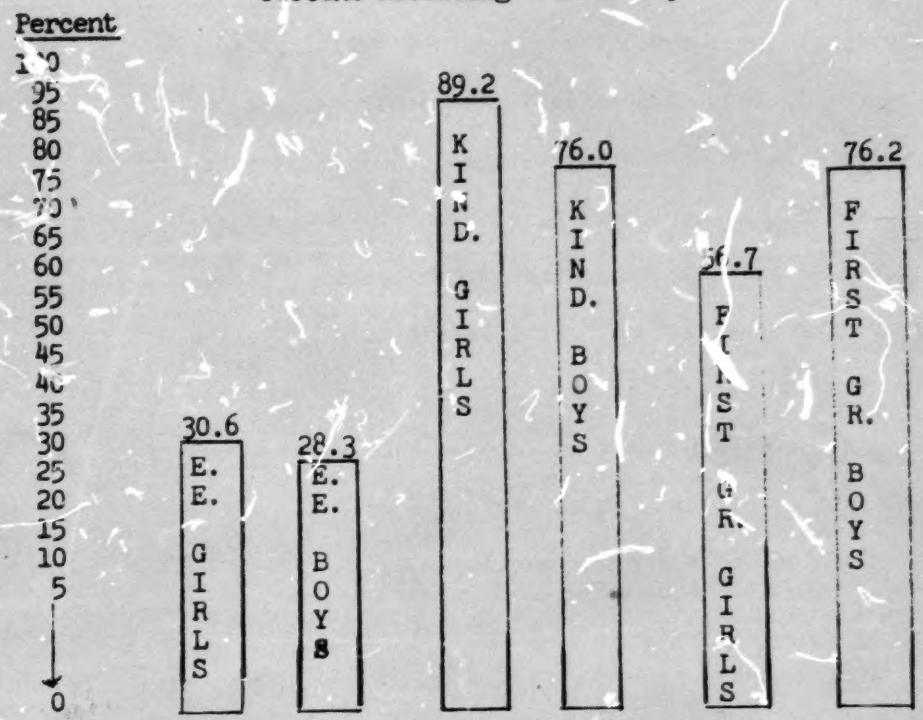
SOCIOMATIC DATA

Pupils were asked to name the classmate with whom they most liked to play. They were also asked to name two other friends. The number of choices received by each pupil could be construed as a measure of peer acceptance.

Results in this area were clear-cut on an overall basis. Early entrants received fewer choices than did the other groups. However, the sex hypothesis was not supported by these findings. The situation is depicted graphically in Graph IV. The percent of pupils receiving four or more peer nominations is charted in the graph.

GRAPH IV

Percent Receiving 4 or more peer choices



It can be seen from the graph that early entrant boys and girls did not widely differ in peer choices. It must be remembered that members of the comparison groups constituted above average individuals. This may be why such high percentages of pupils received four or more peer choices in these groups. It may also be part of the reason for the sex differences among the kindergarten and first grade groups.

CONCLUSIONS AND IMPLICATIONS

Early childhood educators agree philosophically that the social, emotional, physical and intellectual aspects of child growth and development are of equal importance. Therefore, all four factors must be given careful consideration prior to admitting a child early into first grade.

The social aspect, when followed through the maturational continuum, becomes intricately interwoven with prediction of success.

If one considers the need to belong and to become one of the group it is easy to see that a child's self-concept might be adversely affected if he is too young to enter peer group activities which require chronological age restrictions. If a child is too young to go out for the Little League team when all of his friends are playing he is removed from a peer group association and acceptance essential to his development. Should this child encounter the same dilemma on a regular basis he experiences an undue amount of social stress. These kinds of situations, then, could be avoided by opting not to enter early.

It seems vitally important that strategies be developed for allowing children to enter school and remain with their peer group while at the same time providing relevant programs for their intellectual needs.

The implication of this study clearly indicates the need for future research in the form of longitudinal data in order to help school systems assess the long range impact of early entrance in all aspects of child growth and development. Programs, then, can be provided to insure each child the opportunity to reach his total human potential.

TECHNICAL REPORT

APPENDIX A

In the following sections early entrants were separately compared with the kindergarten and the first grade groups. Because it was thought that the consequences of early entrance might be different for boys than girls, results were further subdivided by sex. Originally there were 148 early entrants and 75 pupils whose parents elected that they remain in kindergarten. The original random sample of first grade pupils consisted of 75 pupils. The number of cases in the various tables of this report can be compared with the above figures to document attrition due to missing data. Multiple regression procedures were used to estimate missing scores or item responses in a few cases where most of the other relevant data for an individual pupil were present. The sources of attrition in the study were primarily due to the failure of teachers to return rating forms, pupil absenteeism, and pupil mobility. Differences in the number of cases in each cell from section to section of the report are due to the fact that all available data were utilized in each group of analyses.

A summary of the important findings precedes each section as a convenience to readers.

ACHIEVEMENT TEST FINDINGS

SUMMARY

The data provided no indication that early entrance had a differential effect upon the achievement of boys and girls (there were no significant sex group membership interactions). The gap between the achievement test scores of kindergarteners and early entrants was quite pronounced. It seems safe to assume that the early entrants would not have scored as high on these tests had they remained in kindergarten. The gap between the achievement test scores of early entrants and first graders was not as pronounced. The early entrants "approximated" where they would have been at the end of first grade had they delayed entrance for another year. One may finally conclude that the difference between the academic emphasis of kindergarten programs as opposed to first grade programs seemed to count for more in terms of pupils' test scores than did the age factor.

PROCEDURES

Level B of the Comprehensive Tests of Basic Skills, Expanded Edition, Form S[3] was used as the criterion measure. All testing was conducted in May, 1974. First grade pupils and early entrants took the test as part of a county wide testing program. The test was adminstered to kindergarten pupils in the study by their classroom teachers.

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[3] Comprehensive Tests of Basic Skills, Expanded Edition Form S, Level B, CTB McGraw Hill, Del Monte Research Park, Monterey, California

It may be noted that the frequency distributions of the test data revealed a 'ceiling effect which was quite pronounced on some of the subtests. The selection procedures insured that the first year pupils in the study were above average in academic performance. Therefore, on some of the subtests rather high proportions of early entrants and first grade pupils made perfect or almost perfect scores. For example, in a letter recognition subtests well over half of the pupils in both groups responded correctly to all (22) items. For this reason only scores on the total reading test, total language test, total math test, and the total battery were utilized in the following analyses. The distributions of scores on these tests were well enough spread out to warrant comparisons.

RESULTS

EARLY ENTRANTS VS. KINDERGARTENERS
(Descriptive Data)

AVERAGES AND STANDARD DEVIATIONS
(Raw Scores, Early Entrants vs. Kindergarteners)

TESTS

Sex	Group	Number	Total Reading Aver.	Total Reading SD	Total Language Aver.	Total Language SD	Total Math Aver.	Total Math SD	Total Battery Aver.	Total Battery SD
Male	Early Entrants	49	68.4	14.17	27.9	4.11	41.0	9.79	137.3	24.38
Male	Kindergarteners	21	49.6	18.48	25.8	5.74	29.6	8.74	105.4	25.12
Female	Early Entrants	54	69.8	14.05	29.0	3.40	39.6	9.61	138.3	23.70
Female	Kindergarteners	32	46.9	17.09	26.3	5.07	27.2	10.10	100.9	26.74

Table I indicates that the early entrants clearly scored higher on the achievement tests than did the kindergarten group. It is interesting to note that on the whole the standard deviations indicated greater variability among kindergarten pupils' test scores than among early entrants' scores. This may reflect to some slight extent the fact that the kindergarten programs were individualized. In order to roughly peg the raw scores to national percentiles, the early entrants' average total battery score corresponded to about the 64th percentile. The corresponding scores for kindergarten pupils placed boys at about the 38th percentile and girls at about the 34th percentile.

EARLY ENTRANTS VS. KINDERGARTENERS (STATISTICAL TESTS)

The statistical analyses in this study were carried out by a version of a MANOVA program primarily developed by Elliott Cramer.[4] The analyses were based upon a standard two factor analysis of variance model. The factors were treatment group membership and sex.*

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[4] Cramer, Elliott and Sherin, Richard J. MANOVA, Multivate Analysis of Variance. A program distributed by Clyde Computing Service, Box 166, Coconut Grove Station, Miami, Florida.

* Bookmark pretest scores were available for the groups but were not covaried. This was partly because the selection procedures for the first grade sample seriously restricted the range of their Bookmark scores. Basically it was felt that a simple analyses of variance model adequately met the statistical requirements of the study.

A detailed summary of all statistical tests except those reported in the sociometric analyses is contained in Appendix B.

In view of the very salient observed differences in Table I, the statistical tests were somewhat superfluous in this case. Two major hypotheses which were relevant to this study were tested in each of the statistical analyses which utilized the analysis of variance model. The most complex hypothesis concerned the possibility of differences between boys and girls which could be attributed to early entrance. Instructors felt that girls might adjust to early entrance more easily than boys. This type of effect is technically referred to as an interaction. The statistical hypothesis in essence is a test of whether or not differences between treatment groups can be regarded as the same for both sexes. In this instance, the differences favoring early entrants turned out to be about the same for both sex groups. This fact was reflected in the analysis of variance results being nonsignificant for all statistical tests involving the interaction hypothesis.

The logic of the MANOVA analyses procedes from the complex to the simple. Given significant interactions the analyses would cease, because results would have been shown to depend upon <u>both</u> treatment group membership and sex. Given no significant interaction effect, the MANOVA analyses proceeded to a test of the simple hypothesis that differences between the treatment groups (placing boys and girls together) were

were statistically significant. This was the second of the major hypotheses of relevance to this study. As was noted above, this test was essentially superfluous in the present instance, because of the large observed differences between the groups. The hypothesis of simple between group differences was statistically significant for all of the achievement tests. Table II summarizes average scores on the tests across sex groups.

TABLE II

TREATMENT GROUP EFFECT*
(Raw Scores: Early Entrants vs. Kindergarteners)

TESTS

Group	Number	Tot. Reading Average	Tot. Language Average	Total Math Average	Total Battery Average
Early Entrants	103	69.1	28.4	40.3	137.9
Kindergarteners	53	48.0	26.0	28.3	102.8

EARLY ENTRANTS VS. FIRST GRADERS (Descriptive Data)

Table III summarizes average scores and standard deviations obtained by early entrants and the first grade sample.

*Averages were adjusted for sex disproportionalities in the original four cell tables. This is why the early entrant scores are slightly different in Tables II and IV etc.

TABLE III

AVERAGES AND STANDARD DEVIATIONS
(Raw Scores Early Entrants vs. Firt Graders)

TESTS

Sex	Group	Number	Total Reading Aver.	SD	Total Language Aver.	SD	Total Math Aver.	SD	Total Battery Aver.	SD
Male	First Graders	17	70.5	12.93	30.6	2.37	48.2	5.89	149.4	13.89
Male	Early Entrants	49	68.4	14.17	27.9	4.11	41.0	9.79	137.3	24.38
Female	First Graders	29	77.7	5.86	29.9	4.09	45.0	7.38	152.4	13.18
Female	Early Entrants	54	69.8	14.05	29.0	3.40	39.6	9.61	138.3	23.70

Examination of Table III indicates the first grade group tended to score higher than the early entrants. The standard deviations were smaller for first graders on most of the tests. This indicates that the first grade sample tended to be a more homogenous group in terms of test scores than was the case with the early entrants. However, is some cases the reduction in variance was at least partially due to ceiling effects on the test.** First grade boys total battery score corresponded to about the 74th percentile nationally and girls to about the 78th.

EARLY ENTRANTS VS. FIRST GRADERS (Statistical Tests)

The interaction hypothesis was not statistically significant in any comparison of test results between the sex-treatment groups.

**This is why variance ratios were not tested for statistical significance in this section. Differences in the actual variability between groups were confounded with ceiling effects. The robustness of the analysis of variance procedures could be cited in this instance insofar as the reported tests of significance are concerned. However, no test of significane at all was really needed to test the maturational factor. Had the groups not differed significantly, the most reasonable initial explanation would have been that the first grade sampling procedures had failed to provide an appropriate comparison group.

This meant that differences between early entrant boys and first grade boys could be assumed to be the same as differences between early entrant girls and first grade girls. The above common difference between early entrants of both sexes and first graders of both sexes was found to be statistically significant for all of the achievement tests. Table IV summarizes average scores on the tests across sex groups.

TABLE IV

TREATMENT GROUP EFFECT*
(Raw Scores Early Entrants vs. Kindergarteners)

TESTS

Group	Number	Tot. Reading Average	Tot. Language Average	Total Math Average	Tot. Battery Average
First Graders	46	74.6	30.1	46.3	151.1
Early Entrants	103	69.0	28.5	40.3	137.8

BEHAVIOR RATING FINDINGS

SUMMARY

The basic trends in the behavior rating data were clear. Early entrants were not viewed as favorably by their teachers on these scales as were pupils in the other comparison groups. This was particularly true in the area of self-reliance. In addition, teachers' ratings of early entrants tended to be less uniform than was the case with the comparison groups. This indicates that early entrants' ratings were more spread out than was true within the other groups.

*Averages are adjusted for sex disproportionalities in the original four cell tables.

The evidence regarding the possibility that early entrance had a different effect upon boys than girls was inconclusive. The data indicated such trends, but statistical tests of this hypothesis were not significant. In field study applications such as the present one, it would be folly to place excessive reliance upon the statistical tests. Consistency of results over more than one study would certainly be required before a judicious person would attempt to draw relatively firm substantive conclusions. However, it is intuitively more likely that the stronger trends, such as those noted on the self-reliance scale, would be replicated by a future study than the weaker ones involving the interactions.

PROCEDURES

Instructional personnel selected 29 behavioral rating items* which they felt were appropriate to the study. Teachers rated each pupil in the three groups on these items. Ratings were on a six point scale ranging from exactly like to not at all like.

In order to simplify subsequent analyses, factor analytic procedures were employed on the pooled results of the 29 rated items. The goal was to reduce the 29 items to as few separate dimensions of behavior as was warranted by the item intercorrelations.

*The basis for the selection and development of a local instrument was a behavior rating instrument developed at the University of Chicago under U.S.O.E. Contract No. 519. The latter was part of a report entitled "Techniques For Assessing Social Abilities of Children and Parents in Head Start," 1965.

The statistical procedure employed was principle components analysis, using a verimax rotation. On the basis of a preliminary analysis, eight items which were clearly strongly bipolar or unique were eliminated. A second analysis was run and it was found that three components had eigenvalues greater than unity. The rotated solution of that analysis was made the basis for constructing three subscores. The original scale for the items was retained in constructing the subscores, although the scaling of some items was reversed in terms of the signs of the factor coefficients.

COMPONENTS

Items used for constructing each subscore are given below, with factor coefficients on all components upon which loadings exceeded .30. Items have been regrouped for clarity.

Component I: SELF RELIANCE	Loadings 1	2	3
1. Is able to successfully cope with new experiences generally.	.66		-.46
2. Appears to have confidence in his own abilities.	.62		-.53
3. Fine motor coordination sufficiently developed for task assignments.	.56		
4. Listens well and follows directions.	.78	-.35	
5. Engages in activities with a minimum of assistance from others.	.82		
6. Demonstrates imaginativeness and creativity in his use of materials and equipment.	.69		
7. Tries to figure out things for himself before asking adults or other children for help.	.84		
8. When faced with a difficult task, he either does not attempt it or gives up quickly.	-.49	.44	
9. Demonstrates initiative in problem solving situations.	.84		

		Loadings		
Component II:	HOSTILITY	1	2	3
10.	Finds taking turns to be very difficult.		.80	
11.	Shares materials and equipment with other children.	.31	-.63	
12.	Is often quarrelsome with classmates for minor reasons.		.86	
13.	Has little respect for the rights of other children.		.76	
14.	Works and plays harmoniously with other children.	.41	-.62	-.37
15.	Responds to frustration or disappointment by becoming aggressive.		.78	
16.	Over-responds to usual classroom problems, frustration or disappointment by becoming aggressive.		.63	
Component III:	SOCIABILITY			
17.	Is happy in the school environment.	.39		-.64
18.	Talks eagerly about his own experiences.			-.74
19.	Makes new friends eagerly.			-.74
20.	Has a healthy self-concept.	.43	-.30	-.64
21.	Often withdraws.			.72

Scores on the self-reliance scale could range from nine to fifty-four. Scores on the hostility scale could range from seven to forty-two. Scores on the sociability scale could range from five to thirty. In all cases the higher the score, the more the teachers felt that the trait characterized the pupil.

RESULTS

EARLY ENTRANTS VS. KINDERGARTENERS (Descriptive Data)

TABLE V

AVERAGES AND STANDARD DEVIATIONS
(Early Entrants vs. Kindergarteners)

SCALES

Sex	Group	Number	Self-Reliance		Hostility		Sociability	
			Aver.	SD	Aver.	SD	Aver.	SD
Male	Early Entrants	52	34.5	9.78	18.0	8.37	21.9	4.36
Male	Kindergarteners	24	43.5	7.06	14.7	6.44	24.3	4.50
Female	Early Entrants	60	38.8	9.39	14.6	5.52	23.8	4.41
Female	Kindergarteners	36	42.8	6.63	14.7	6.35	23.5	4.88

Examination of Table V indicates that early entrant boys tended to score lower on the self-reliance and sociability scales and higher on the hostility scale than did the kindergarten boys. Early entrant girls' scores on the self-reliance scale were also lower than those obtained by kindergarten girls. There was also a definite tendency for early entrants of both sexes to be more variably distributed than kindergarteners on the self-reliance scales.

EARLY ENTRANTS VS. KINDERGARTENERS (Statistical Tests)

Simple statistical comparisons of the variance ratios for groups within each sex were calculated for the self-reliance scores. Results were statistically significant for girls and approached significance for boys. This gives some indication that teachers' ratings of early entrants on this dimension were less uniform than their ratings of kindergarten pupils. Although hostility scores were more variable for early entrant than kindergarten boys, the variance ratio was not statistically significant.

It would be defensible to conclude from the above and the descriptive data, that bright kindergarten pupils tended to be regarded as relatively more self-reliant by their teachers than was the case with early entrants. Ratings of early entrants, however, tended to be more variable than was the case with kindergarteners.

In a strict sense the validity of the additional statistical analyses which follow depend upon the assumption that variances within each comparison group be equal. The simple statistical tests referred to above cast some doubt upon the viability of this assumption in terms of the self-reliance scale. However, most statisticians would agree that the tests of significance reported below would not be likely to seriously misrepresent the actual situation. These tests can be regarded

as assessing the probability that early entrants and kindergarten pupils were randomly drawn from the same population and that any observed group differences in average scores were due to sampling errors.*

As in the preceding section, two tests of statistical significance were relevant to the study. The first statistical test concerned the interaction of the sex treatment group factors. Were differences due to group membership the same for members of both sexes? In other words were behavior rating scores dependent upon both group membership and sex?

The tests of the interaction effect were not found to be statistically significant for any of the behavior rating scales. Probabilities ranged from .065 to .13, reflecting the tendency for the group differences between boys to be somewhat more pronounced than was the case among girls. This situation was noted in the descriptive section. Since none of the probabilities reached the convential .05 level of significance, one would be taking more than the conventional risk of being in error, if one posited that group differences in ratings of boys were greater than such differences in ratings of girls.

*Statisticians have used Monte Carlo methods to ascertain how far wrong tests of significance are likely to go when the assumption of equal variances does not hold. When departures are not great, as was the case here, the accuracy of the results of statistical tests are not seriously effected.

The second statistical test concerned simple differences between groups which were not also dependent upon sex. Statistically significant results on the second test of signifiance were obtained only on the self-reliance scale. Average scores on this test, combined across sexes, are reported in Table VI.

TABLE VI

GROUP EFFECT*

SELF-RELIANCE SCALE
(Early Entrants vs. Kindergarteners)

Group	Number	Average
Early Entrants	112	36.7
Kindergarteners	60	42.8

Inspection of Table VI shows that kindergarten pupils of both sexes received higher ratings on self-reliance than did early entrants.

EARLY ENTRANTS VS. FIRST GRADERS (Descriptive Data)

TABLE VII

AVERAGES AND STANDARD DEVIATIONS
(Early Entrants vs. First Graders)

SCALES

			SELF-RELIANCE		HOSTILITY		SOCIABILITY	
Sex	Group	Number	Aver.	SD	Aver.	SD	Aver.	SD
Male	First Graders	21	41.6	7.26	16.1	6.85	24.2	4.10
Male	Early Entrants	52	34.5	9.78	18.0	8.37	21.9	4.36
Female	First Graders	33	39.8	8.78	14.4	6.52	23.4	3.98
Female	Early Entrants	60	38.8	9.39	14.6	5.52	23.8	4.41

*Averages are adjusted for sex disproportionalities in the original four fell table.

Examination of Table VII reveals trends somewhat similar to the comparisons of early entrants with kindergarten pupils. First grade boys received higher ratings on self-reliance and sociability and lower ratings on hostility than did early entrant boys. Differences between girls were not large. Ratings of early entrants tended to be more variable than those of first graders on most of the scales.

EARLY ENTRANT VS. FIRST GRADERS (Statistical Tests)

Differences in variance ratios were not as pronounced in Table VII as was the case with the kindergarten ratings. Therefore, analyses proceeded directly to the statistical tests of the two relevant hypotheses regarding group differences.

The interaction hypotheses that group differences depended also upon sex approached statistical significance on the self-reliance (P less than .051) and sociability (P less than .06) scales. The source of these findings was discussed in the descriptive section; i.e., differences between boys were more pronounced than differences between girls. As was the case with the kindergarten data, acceptance of the interaction hypotheses would require one to exceed the conventional .05 risk of accepting a false hypothesis.

The hypothesis of groups differences independent of sex was statistically significant only for the self-reliance scale. Average scores across sexes on this scale are presented in Table VIII.

TABLE VIII

GROUP EFFECT*
(Early Entrants vs. First Graders)

SELF-RELIANCE

SCALE

Group	Number	Average
First Graders	54	40.2
Early Entrants	112	36.7

Table VIII shows that first graders, considered independently of sex, received higher ratings on the self-reliance scale than did early entrants.

*Averages are adjusted for sex disproportionalities in the orginial four cell table.

SOCIOMETRIC FINDINGS

SUMMARY

Early Entrants clearly were: Less popular with their classmates than would have likely been the case had they been in kindergarten and they were less popular with their classmates at the end of their first grade year than would likely have been the case had they finished first grade one year later.

PROCEDURES

Degree of peer acceptance was considered to be a critical factor in assessing the consequences of early entrance. Teachers administered a sociometric device to measure this dimension. Pupils were asked to name the classmate they liked to play with best. They were also asked to name two other friends.

In order to analyze the resultant data, it was posited that if choices were randomly distributed. each pupil would be expected to be named by three peers. On the basis of this assumption, children receiving four or more nominations would exceed chance expectations. Basically, the methods adopted in this section provided a simple and convenient way to highlight the major trends contained in the data. Trends were sufficiently strong that alternative methods could not but have produced similar conclusions.* In any event the number of

*Whether or not peer nominations could be viably regarded as randomly distributed among pupils in classes was a hypothesis which could have been tested in this study. However, choices received by every child in every class rather than just those in the study would have had to be tabulated. The issue was irrelevant to this study so no efforts were made in this direction.

peer choices chosen for constructing the levels in the following contingency tables did not really require any theoretical grounding. The choice of levels could have been made arbitrarily, but the above rationale was utilized in hopes of contributing a degree of additional interpretative meaning to the tables.

The following tables summarize the findings in this area:

EARLY ENTRANTS VS. KINDERGARTENERS

TABLE IX

FEMALES
(Early Entrants vs. Kindergarteners)*

CHOICES

Groups	0-3	4 or more	Totals
Early Entrants	43	19	62
Kindergarteners	4	33	37
Totals	47	52	99

Chi-Square - 29.54**, P. less than .01

TABLE X

MALES
(Early Entrants vs. Kindergarteners)

CHOICES

Groups	0-3	4 or more	Totals
Early Entrants	38	15	53
Kindergarteners	6	19	25
Totals	44	34	78

Chi-Square - 15.72, P. less than .01

*The numbers of cases in these tables will differ from other analyses because all available data was utilized in each analysis.

**Yates' correction was used.

The tables make it clear that the early entrants of both sexes were significantly less likely to receive an above chance number of peer choices than were those pupils remaining in kindergarten.

EARLY ENTRANTS VS. FIRST GRADERS

TABLE XI

FEMALES
(Early Entrants vs. First Graders)

CHOICES

Groups	0-3	4 or more	Totals
Early Entrants	43	19	62
First Graders	13	17	30
Totals	56	36	92

Chi-Square - 5.75, P. less than .05

TABLE XII

MALES
(Early Entrants vs. First Graders)

Groups	0-3	4 or more	Totals
Early Entrants	38	15	53
First Graders	5	16	21
Totals	43	31	74

Chi-Square - 14.17, P. less than .01

Comparisons of early entrants with first grade pupils revealed that proportionately more first grade pupils of both sexes received four or more peer nominations. These trends were statistically significant.

APPENDIX B

SUMMARIES OF STATISTICAL TESTS

I. ANALYSIS OF VARIANCE TABLES

A. ACHIEVEMENT

1. EARLY ENTRANTS VS. KINDERGARTENERS

a. Interaction Effect DF=1,152

Tests	F	Mean Square	P less than
Total Reading	.581	137.5	.447
Total Language	.109	2.1	.742
Total Math	.102	9.5	.750
Total Battery	.432	264.4	.512

b. Treatment Main Effect OF=1,152

Tests	F	Mean Square	P less than
Total Reading	65.681	15,549.1	.001
Total Language	11.120	210.7	.001
Total Math	53.427	4,986.1	.001
Total Battery	70.004	42,866.4	.001

2. EARLY ENTRANTS VS. FIRST GRADERS

a. Interaction Effect DF=1,145

Tests	F	Mean Square	P less than
Total Reading	1.520	248.8	.220
Total Language	1.615	21.9	.206
Total Math	.393	31.4	.532
Total Battery	.065	30.2	.799

b. Treatment Main Effect DF=1,145

Tests	F	Mean Square	P less than
Total Reading	5.985	979.9	.016
Total Language	6.190	83.8	.014
Total Math	14.369	1,147.0	.001
Total Battery	11.852	5,523.7	.001

B. BEHAVIOR RATING SCALES

1. EARLY ENTRANTS VS. KINDERGARTENERS

a. Interaction Effect DF=1,168

Scales	F	Mean Square	P less than
Self-Reliance	3.069	233.2	.082
Hostility	2.314	106.5	.130
Sociability	3.446	70.0	.065

b. Treatment Main Effect DF=1,168

Scales	F	Mean Square	P less than
Self-Reliance	19.040	1,446.6	.001
Hostility	1.508	69.4	.221
Sociability	1.480	30.1	.225

2. EARLY ENTRANTS VS. FIRST GRADERS

a. Interaction Effect DF=1,162

Scales	F	Mean Square	P less than
Self-Reliance	3.863	324.3	.051
Hostility	.513	24.3	.475
Sociability	3.576	65.3	.060

b. Treatment Main Effect DF=1,162

Scales	F	Mean Square	P less than
Self-Reliance	5.183	435.1	.024
Hostility	.632	29.9	.428
Sociability	1.124	20.5	.291

II. TESTS OF VARIANCE RATIOS

1. SELF-RELIANCE

a. Early Entrant Boys vs. Kindergarten Boys:

DF=51,23 F=1.92 P less than .10

b. Early Entrant Girls vs. Kindergarten Girls:

DF=59,35 F=2.01 P less than .05

2. HOSTILITY

a. Early Entrant Boys vs. Kindergarten Boys:

DF=51,23 F=1.69 P less than .20